

WHAT IS CLAIMED IS:

1. A method for adapting a wireless communications link between a transmitter and a receiver wherein information is communicated in a downlink direction from a base transceiver station to multiple subscriber units and in an uplink direction from said multiple subscriber units to said base transceiver station comprising:
 - establishing a radio frequency (RF) bandwidth as a communications channel in a wireless communications system;
 - establishing a desired channel quality for uplink communications between said transmitter and said receiver over said communications channel; and
 - reducing said RF bandwidth of said communications channel for uplink communications to achieve said desired channel quality.
2. The method of claim 1 wherein reducing said RF bandwidth is preceded by:
 - determining a current channel quality for uplink communications between said transmitter and said receiver over said communications channel;
 - utilizing all of said RF bandwidth of said communications channel for uplink communications if said current channel quality meets said desired channel quality; or
 - reducing said RF bandwidth of said communications channel to achieve said desired channel quality and utilizing said reduced RF bandwidth of said communications channel for uplink communications if said current channel quality does not meet said desired channel quality.
3. The method of claim 1 further including allocating additional uplink time slots for uplink communications over said communications channel with said reduced RF bandwidth to maintain a desired uplink transmission rate between said transmitter and said receiver over said communications channel with said reduced RF bandwidth.

4. The method of claim 3 further including taking time slots from other uplink communications channels to compensate for said additional uplink time slots that are allocated to said uplink communications channel with said reduced RF bandwidth.

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5. The method of claim 3 further including:
indicating to said transmitter, the frequency range of the reduced RF bandwidth that is to be used for subsequent uplink transmissions; and
indicating changes in time slot allocations as a result of the uplink channel
10 with the reduced RF bandwidth.

6. The method of claim 1 further including utilizing time division duplexing for downlink and uplink communications.

15 7. The method of claim 1 wherein the RF bandwidth for downlink communications is greater than the RF bandwidth for uplink communications.

8. The method of claim 1 wherein reducing said RF bandwidth includes of:
dividing said RF bandwidth into uplink sub-channels; and
20 assigning at least one of said uplink sub-channels to said transmitter for uplink communications.

9. The method of claim 8 wherein dividing said RF bandwidth into uplink sub-channels includes dividing said RF bandwidth into n uplink sub-channels of equal
25 RF bandwidth size, where n is an integer.

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- assigning a number, m , of uplink sub-channels to said communications channel such that said desired signal-to-noise ratio is met for uplink communications, wherein m is an integer.

- assigning a number of uplink sub-channels to said communications channel such that said desired signal-to-noise ratio is met for uplink communications.

13. The method of claim 12 further including utilizing time division duplexing to communicate in the uplink and downlink directions.

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15. A system for adapting a wireless communications link between a transmitter and a receiver in a wireless communications system wherein information is communicated in a downlink direction from a base transceiver station to multiple subscriber units and in an uplink direction from said multiple
5 subscriber units to said base transceiver station, said wireless communications system having an established communications channel with a known RF bandwidth and a desired channel quality in the uplink direction, said system comprising:

means for reducing said RF bandwidth of said communications
10 channel for uplink communications between said transmitter and said receiver to achieve said desired channel quality if said desired channel quality will not be achieved using all of said RF bandwidth of said communications channel for uplink communications.

16. The system of claim 15 wherein said means for reducing said RF
15 bandwidth further includes means for allocating additional uplink time slots for uplink communications over said uplink communications channel to maintain a desired uplink transmission rate between said transmitter and said receiver over said uplink communications channel with said reduced RF bandwidth.

17. The system of claim 15 further including a quality of service manager for
20 supplying said desired channel quality to said means for reducing said RF bandwidth.

18. The system of claim 15 further including a time slot manager for allocating
25 additional time slots to said uplink communications channel with said reduced RF bandwidth.

19. The system of claim 15 further including a channel manager for dividing
30 said established communications channel into uplink sub-channels.

20. The system of claim 15 wherein said means for reducing said RF bandwidth operates in response to a signal received from said transmitter at said receiver, wherein said receiver is located within said base transceiver station and said transmitter is located within one of said multiple subscriber units.

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21. A method for adapting a wireless communications link between a transmitter and a receiver wherein information is communicated in a downlink direction from a base transceiver station to multiple subscriber units and in an uplink direction from said multiple subscriber units to said base transceiver station comprising:

identifying a radio frequency (RF) bandwidth that is available for use as a communications channel in a wireless communications system;

establishing a desired channel quality for uplink communications between said transmitter and said receiver over said communications channel; and

selecting a portion of said RF bandwidth that enables said desired channel quality to be met for uplink communications.

22. The method of claim 21 wherein selecting a portion of said RF band is preceded by:

determining a current channel quality for uplink communications between said transmitter and said receiver over said communications channel;

utilizing all of said RF bandwidth of said communications channel for uplink communications if said current channel quality meets said desired channel quality; or

reducing said RF bandwidth of said communications channel to achieve said desired channel quality and utilizing said reduced RF bandwidth of said communications channel for uplink communications if said current channel quality does not meet said desired channel quality.

23. The method of claim 21 further including allocating additional uplink time slots for uplink communications over said communications channel to maintain a desired uplink transmission rate between said transmitter and said receiver over said communications channel.

24. The method of claim 23 further including taking time slots from other uplink communications channels to compensate for said additional uplink time slots that are allocated to said uplink communications channel.

5 25. The method of claim 23 further including:
 indicating to said transmitter, the frequency range of said selected portion of said RF bandwidth that is to be used for subsequent uplink transmissions; and
 indicating changes in time slot allocations to said transmitter.

10 26. The method of claim 21 further including utilizing time division duplexing for downlink and uplink communications.

27. The method of claim 26 wherein the RF bandwidth for downlink communications is greater than the RF bandwidth for uplink communications.

15 28. The method of claim 1 wherein selecting a portion of said RF bandwidth includes:

 dividing said RF bandwidth into uplink sub-channels; and
 assigning at least one of said uplink sub-channels to said transmitter for
 20 uplink communications.

29. The method of claim 28 wherein dividing said RF bandwidth into uplink sub-channels includes dividing said RF bandwidth into n uplink sub-channels of equal RF bandwidth size, where n is an integer.

25 30. The method of claim 28 further including:
 establishing a desired signal-to-noise ratio as said desired channel quality for uplink communications;
 assigning a number, m , of uplink sub-channels to said communications
 30 channel such that said desired signal-to-noise ratio is met for uplink communications, wherein m is an integer.

31. The method of claim 28 further including:
establishing a desired signal-to-noise ratio as said desired channel quality
for uplink communications;

5 assigning a number of uplink sub-channels to said communications
channel such that said desired signal-to-noise ratio is met for uplink
communications.

32. The method of claim 31 further including allocating additional time slots for
uplink communications to maintain a constant uplink transmission rate.

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33. The method of claim 32 further including utilizing time division duplexing to
communicate in the uplink and downlink directions.

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34. The method of claim 21 further including indicating, to said transmitter, the
frequency range of said selected portion of said RF bandwidth that is to be used
for subsequent transmissions.

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